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(71) Applicant(s)

Trico Products Corporation
(Incorporated in USA - New York)
817 Washington Street, Buffalo,
New York 14203-1298, United States of America

(72) Inventor(s)

Marc Couch
Alistair Duncan Robertson
Mark Anthony Lewis
Jonathan Smith
Dean Cubitt

(74) Agent and/or Address for Service

Wynne-Jones, Lainé & James
Morgan Arcade Chambers, 33 St Mary Street,
CARDIFF, CF1 2AB, United Kingdom

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(56) Documents Cited
GB 2224810 A GB 1334352 A GB 0664062 A
GB 0547989 A EP 0835792 A2 US 5729860 A

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(54) Abstract Title

Drive shaft connections

(57) A drive head 1 has a recess 2 formed at one end defining a base plate 3 formed with a central opening 4. An insert member 5 is moulded within the opening 4 about part of the base plate 3. The insert member 5 has one or more ears which locate within respective notches 6 in the base plate 3 to prevent rotation of the insert member. The insert member incorporates a DIN tapered passageway 7 to receive a DIN tapered shaft which will be fixed in place by a locking nut which will sit within the outer part 8 of the recess 2. Instead of notches in a base plate, the drive head may have holes (13, Fig 4) engaged by projections (12, Fig 5). In a different construction, the tapered passageway (19, Fig 7) is formed by making the drive head (15) from a metal sheet folded back on itself.

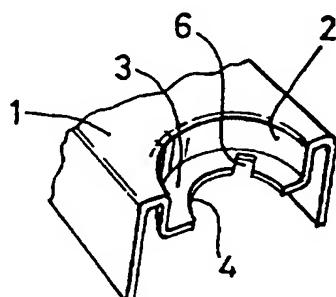


Fig. 2

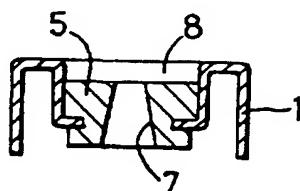


Fig. 3

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At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy. The claims were filed later than the filing date but within the period prescribed by Rule 25(1) of the Patents Rules 1995. The print reflects an assignment of the application under the provisions of Section 30 of the Patents Act 1977.

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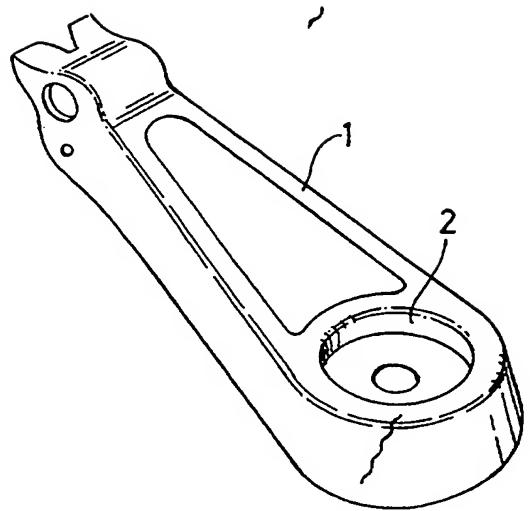


Fig. 1

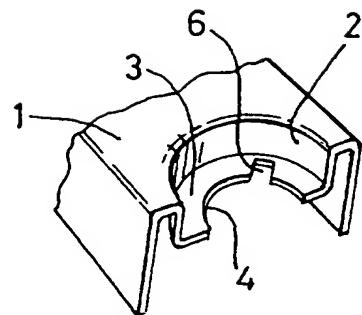


Fig. 2

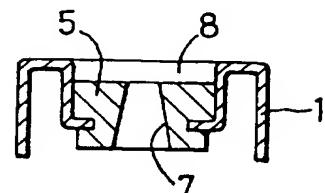


Fig. 3

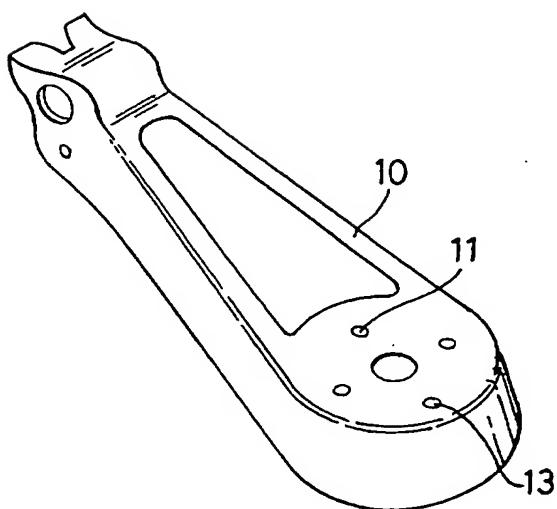


Fig. 4

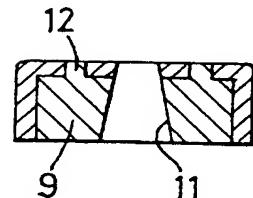


Fig. 5

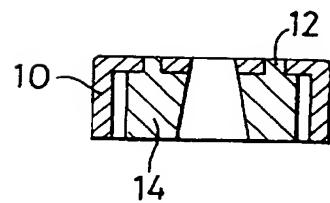


Fig. 6

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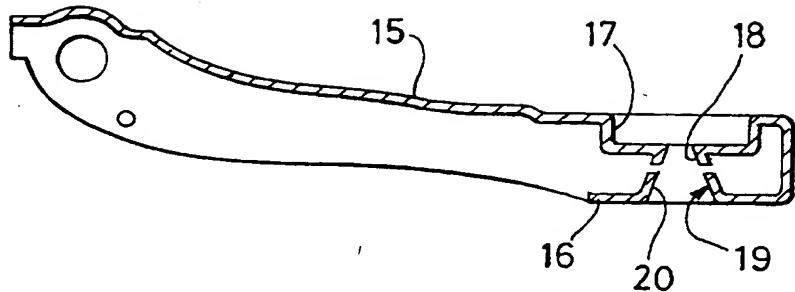


Fig. 7

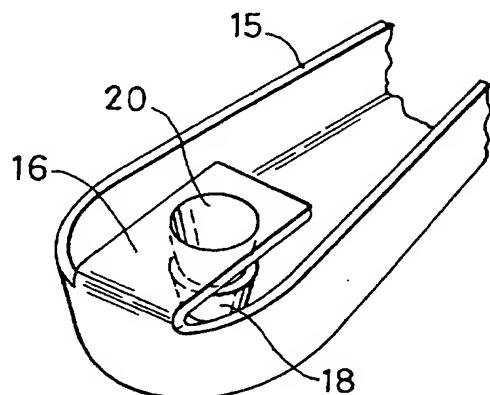
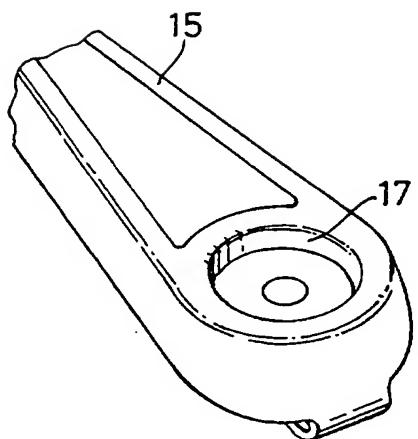


Fig. 8

Fig. 9

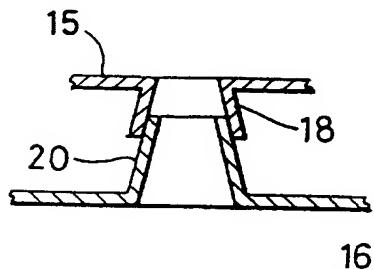


Fig. 10

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Improvements relating to Drive Shaft Connections
to Drive Heads

A particular type of drive shaft is of a tapered DIN shape so that it can be located within a corresponding recess within a drive head and locked there by means of a locking nut. This invention aims to provide secure means
5 for location of such a drive shaft within a drive head.

According to one aspect of the present invention there is provided a tapered DIN shaft locating arrangement on a drive head and comprising an opening through the drive head for passage of part of the DIN shaft, an insert member
10 having an internal tapered passageway corresponding to the DIN taper of the DIN shaft and locating formations on the drive head and the insert member for securing the insert member against rotation relative to the drive head and ensuring that the opening in the drive head and the passage-
15 way in the insert member are axially aligned.

With such an arrangement the insert (which receives the tapered shaft) is locked with the drive head. However a standard form of drive head can be used with a variety of inserts adapted for use with particular drive shafts, and
20 vice versa.

In one example the portion of the drive head incorporating the opening is in the base of a recessed part of the drive head body which also receives said insert member so that part of the insert member projects into the opening and
25 the remainder thereof sits on said base. The recessed part not only accommodates the insert member but also can be deep

enough to house the locking nut (and possibly a protective cover for the locking nut). In this arrangement the locking formation preferably comprises at least one notch in the base plate leading from said opening and one or more corresponding ears on the periphery of the insert member. The insert member can be deformed after insertion to lock it against axial movement relative to the drive head. Alternatively the insert member could be moulded in place about the material of the drive head surrounding said opening.

10 In an alternative design the insert member may be located within a drive head of U-shaped cross-section. Again a range of inserts and drive heads can be interconnected as desired. In this arrangement the or each locating formation can comprise a hole punched in the body of the 15 drive head with corresponding projections formed from the insert member to locate therein.

The insert member can be shaped from metal or moulded from a plastics material.

From a further aspect the invention provides a drive 20 head formed from pressed metal sheet, wherein an end portion of the sheet is folded back below an upper face portion of the drive head and aligned pressings are made in said two portions towards one another so that, in combination, the two pressings define a DIN tapered passageway for accommodation of a tapered DIN shaft.

When the tapered drive shaft is inserted into the combined tapered passageway and a locking nut is locked on, the aligned pressings are pressed towards one another to

enhance the clench effect onto the shaft.

The upper face portion can define a recess, aligned with said passageway, for accommodation of a locking nut.

It would be possible to provide for the pressings to 5 nest with one another so that again, as the locking nut is driven home, an enhanced gripping effect onto the sides of the drive shaft will be achieved. In this embodiment it is envisaged that the drive head could be shaped generally of U-shaped cross-section.

10 The invention may be performed in various ways and a few preferred embodiments will now be described, by way of example, with reference to the accompanying drawings, in which:-

15 Figure 1 is a perspective view of a drive head arrangement of this invention;

Figure 2 is a cut-away part of a locating portion of a drive head for a drive shaft;

Figure 3 is a vertical section through a combined drive head and insert member of Figure 1;

20 Figure 4 is a perspective view of an alternative form of drive head of this invention;

Figures 5 and 6 are vertical sections through two possible designs of insert member received within the drive head of Figure 4;

25 Figure 7 is a vertical section through a third embodiment of drive head of this invention;

Figures 8 and 9 are plan and underneath plan views of the drive head shown in Figure 7; and

Figure 10 is a vertical section through an alternative construction for the drive head of Figure 7.

In the arrangement shown in Figures 1 to 3 a drive head 1 has a recess 2 formed at one end defining a base plate 3 5 formed with a central opening 4. An insert member 5 is moulded within the opening 4 about part of the base plate 3. An ear (not shown) of the insert member 5 locates within a notch 6 in the base plate 3 to prevent rotation of the insert member 5. The insert member 5 incorporates a DIN 10 tapered passageway 7 within which will be received a DIN tapered shaft which will be fixed in place by a locking nut which will sit within the outer part 8 of the recess 2. If desired more notches 6 and corresponding ears can be formed on the interconnected parts.

15 In the arrangement shown in Figures 4 and 5 an insert member 9 is housed within the U-shaped form of drive head 10. Again the insert member is provided with a DIN tapered passageway 11. Projections 12 on the upper face of the insert 9 pass into holes 13 in the drive head 10 so as to 20 prevent rotation of the insert 9. As can be seen from Figure 6 the insert 14 does not necessarily need to fit snugly within the drive head 10. A variety of different shapes for the insert can be employed to suit particular purposes without needing to alter the shape of the drive head 10. This applies also to the embodiment shown in 25 Figure 1 to 3.

In the arrangement shown in Figures 7 to 9 the DIN tapered passageway is formed as part of the pressing of a

metal sheet which creates a drive head 15. As can be seen from Figures 7 and 9 in particular a portion 16 of the sheet is folded back below the main body. On the upper face of the drive head a recess 17 is formed together with a 5 pressing 18 which creates part of the tapered passageway 19. A further pressing 20 is formed from the sheet portion 16 in alignment with the pressing 18 so as to define the remainder of the tapered passageway 19. When a drive shaft is locked into the passageway 19, tightening of a nut onto the drive 10 shaft will force the two pressings 18 and 20 toward one another to enhance the clenching effect onto the drive shaft. The locking nut will be housed within the recess 17.

As shown in Figure 10 the pressings 18 and 20 could be formed to overlap, so that one fits into the other and this 15 can give added strength to the assembly.

CLAIMS

1. A tapered DIN shaft locating arrangement on a drive head and comprising an opening through the drive head for passage of part of the DIN shaft, an insert member 5 having an internal tapered passageway corresponding to the DIN taper of the DIN shaft and locating formations on the drive head and the insert member for securing the insert member against rotation relative to the drive head and ensuring that the opening in the drive head and the passageway in the insert member are axially aligned.

10 2. An arrangement according to Claim 1, wherein the portion of the drive head incorporating the opening is in the base of a recessed part of the drive head body which also receives said insert member so that part of the insert member projects into the opening and the remainder thereof sits on said base.

15 3. An arrangement according to Claim 2, wherein the locating formation comprises at least one notch in the base plate leading from said opening and one or more corresponding ears on the periphery of the insert member.

20 4. An arrangement according to Claim 2 or Claim 3, wherein the insert member is deformed after insertion to lock it against axial movement relative to the drive head.

25 5. An arrangement according to Claim 2 or Claim 3, wherein the insert member is moulded in place about the material of the drive head surrounding said opening.

6. An arrangement according to Claim 1, wherein the insert member is located within a drive head of U-shaped cross-section.

7. An arrangement according to Claim 6, wherein the 5 or each locating formation comprises a hole punched in the body of the drive head and corresponding projections are formed from the insert member to locate therein.

8. An arrangement according to any one of Claims 1 to 7, wherein the insert member is shaped from metal or moulded 10 from a plastics material.

9. A drive head formed from pressed metal sheet, wherein an end portion of the sheet is folded back below an upper face portion of the drive head and aligned pressings are made in said two portions towards one another so that, 15 in combination, the two pressings define a DIN tapered passageway for accommodation of a tapered DIN shaft.

10. A drive head 8, wherein said upper face portion defines a recess, aligned with said passageway, for accommodation of a locking nut.

20 11. A drive head according to Claim 9 or Claim 10, wherein said pressings nest within one another.

12. A drive head according to any one of Claims 9 to 11, wherein said drive head is shaped generally of U-shaped cross-section.

25 13. A shaft locating arrangement substantially as herein described with reference to the accompanying drawings.



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Application No: GB 9813847.2
Claims searched: 1 - 8

Examiner: C J Duff
Date of search: 14 September 1999

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.Q): F2U

Int Cl (Ed.6): B60S 1/16, 1/18, 1/32, 1/34; F16D 1/06, 1/064, 1/072, 1/08, 1/09

Other: On-line: EPODOC, JAPIO, WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	GB 2224810 A (TRICO) page 2, line 33 - page 3, line 15	1, 8
X	GB 1334352 (BOSCH) page 1, lines 53 - 59	1, 6
X	GB 0664062 (O'SHEI) Fig 3	1, 6
X	GB 0547989 (TRICO) Whole document	1, 6, 8
X	EP 0835792 A2 (ITT) Whole document	1, 2, 6, 8
X	US 5729860 (LISIECKI) Whole document	1, 8

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
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